California Division of Mines and Geology

Fault Evaluation Report FER-90

May 16, 1979

1. Name of fault

Dixieland fault.

2. Location of fault

About 20 km west of El Centro along Highway 80, Plaster City quadrangle, Imperial County, California (figure 1).

3. Reason for evaluation

This area lies within the 1978 study area of the 10-year program for fault evaluation.

4. List of references

Sharp, R.V., and Clark, M.M., 1972, Geologic evidence of previous faulting near the 1968 rupture on the Coyote Creek fault, In The Borrego Mountain earthquake of April 9, 1968: U.S. Geological Survey Professional Paper 787, p. 131-140.

Jennings, C.W., 1975, Fault map of California with locations of volcanoes, thermal springs and thermal wells: California Division of Mines and Geology, California Geologic Data Map Series, Map No. 1, Scale 1:750,000.

Real, C.R., Parke, D.L., and Toppozada, T.R., 1978, Magnetic tape catalog of California earthquakes, 1900-1974: California Division of Mines and Geology.

5. Summary of available data

The features herein referred to as the "Dixieland fault" were first observed by James Barclift, an Imperial County Sheriff's Deputy, in December 1969. His findings were reported in the Brawley, California News, edition of December 24, 1969.

The above information was obtained from James Kahle (personal communication, 5/14/79). Sharp and others (1972) show the Dixieland fault on their figure 90 (p. 133). It is shown in the extreme southern end of their map, and is labeled "1969 rupture." They mention the feature on p. 139, "...an extensive zone of fresh fractures of possible tectonic origin crosses Highway 580 along the projection about 1.5 km west of Dixieland (figure 90)." The "projection" is a speculated southeastward extension of the Coyote Creek fault beneath the western side of the Salton trough.

No further description of the Dixieland fault is given.

Seismicity

The epicenter map (figure 2) shows no epicenters closer than 10 km to the Dixieland fault.

6. Interpretation of aerial photography

None.

7. Field observations

The site of the features referred to as the Dixieland fault is along Highway 580, about 0.9 miles west of the westside main canal (figure 3). I visited the site with James Kahle in September, 1973, and again by myself, in March, 1979. In 1973, I observed numerous eroded fissures and sink-holes in the ground along a zone 100 to 200 feet wide and perhaps 700 feet in length. Both the zone, and the longer fissures, had a general south-southeastward trend. The zone of observable features extended from near the railroad tracks on the south to a point several hundred feet north of the highway (figure 3). The individual features included sink holes and fissure-like depressions up to perhaps 3 feet in width and depth.

In all cases, the depressions seemed to be caused by erosional processes along cracks that extended to an unknown depth in the ground. Erosion had widened the upper part of the cracks and, presumably, carried the eroded material downward into the cracks. The soil in this area is a clayey silt.

When I revisited the site in 1979, I could find only a few shallow depressions, less than one foot deep, in a small area extending from about 10 to 58 feet north of the highway. This is the area where I observed the greatest development of depressions in 1973. The depressions remaining in 1979 do not appear to still be forming, but rather appear to be the last of the former larger depressions that have not yet been completely filled in.

I do not recall having observed any highway damage in 1973, but I seem to recall that the highway had been recently repaved. I observed no anamolous cracking of the highway at the site in 1979.

8. Conclusions

It is certain that minor ground rupture occurred at this site, probably no more than two years before the discovery in December of 1969. It is probable that the features are of tectonic origin; there is no evidence of unusual ground water withdrawal nearby. This faulting, if that is what it is, may be related to the Coyote Creek fault as suggested by Sharp and others (1972, p. 139). However, the nearest surface expression of the Coyote Creek fault is more than 15 miles to the northwest.

9. Recommendations

Because of the very local nature of this feature, and the uncertainty as to its origin, I do not recommend that a special studies zone be established around it.

10. Investigating geologist's name and date

Drew P. Smith

DREW P. SMITH
May 16, 1979

I agree; there is no direct evidence of surface fault rupture. It would appear to me that the main surface hazard is soil collapse or differential subsidence.
EWH
5/17/79

R/L Creep of 4.5 mm/yr reported in strain studies 1970-1983 by CA Allen and K.E. Sieh (USGS OFR 83-525, p. 162). need to re-evaluate for possible Zoning.
EWH
10/17/83

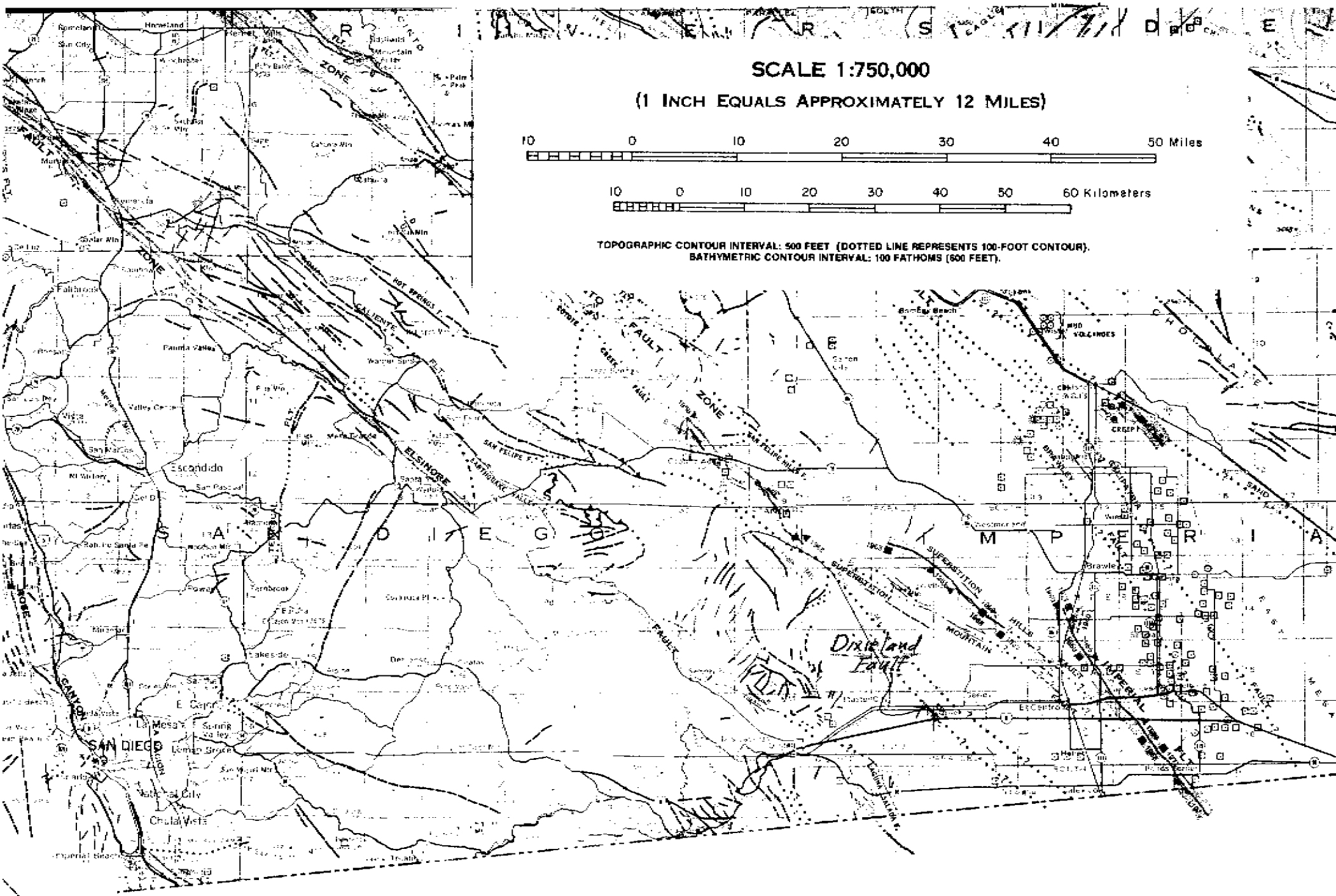

Figure 1. Index map showing the location of the Dixieland fault. Map is modified from Jennings (1975).

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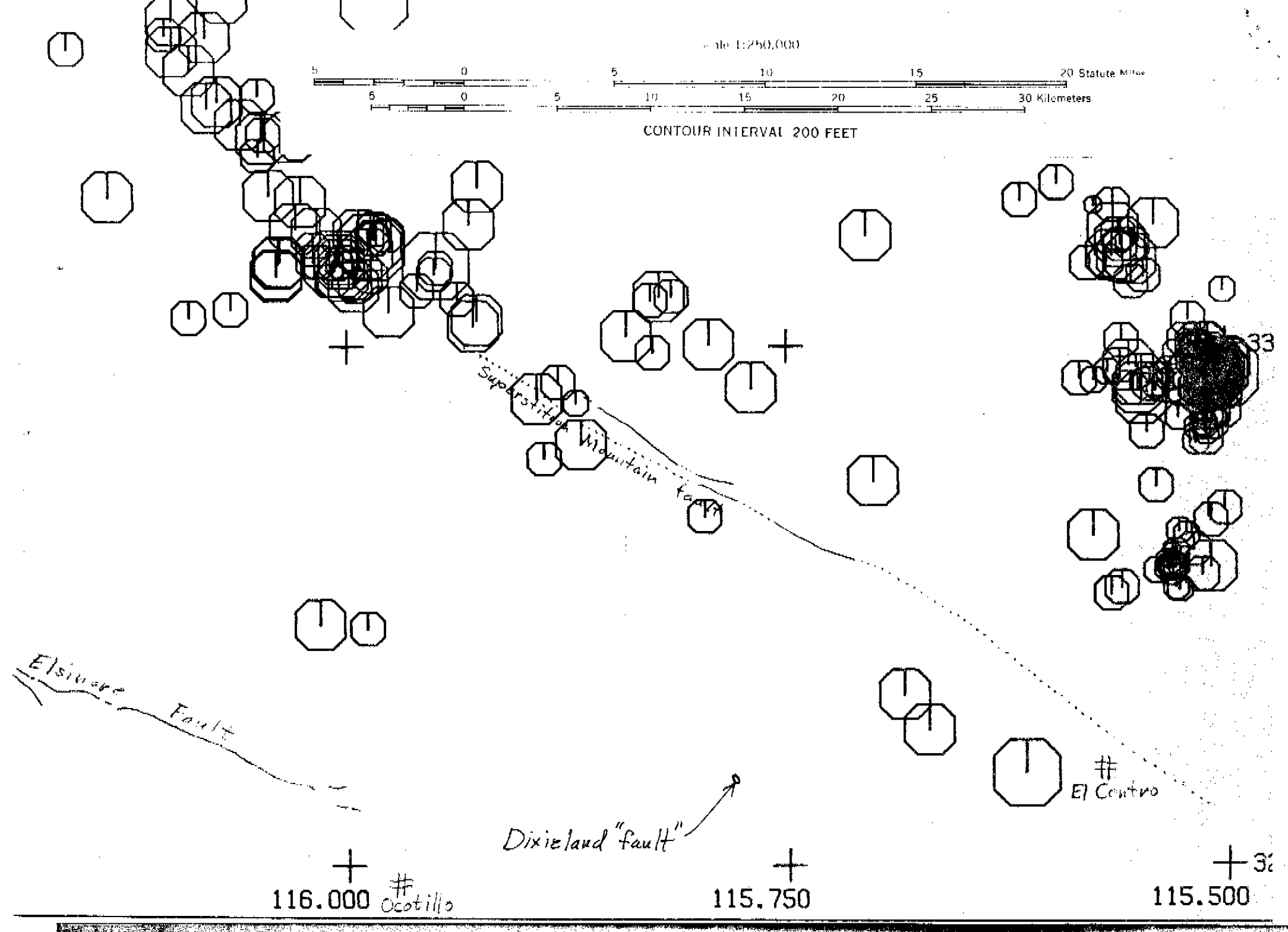

EARTHQUAKE EPICENTERS IN SAN DIEGO "A" quality data

TRANSVERSE MERCATOR PROJECTION

SCALE = 1/250000

MAGNITUDE

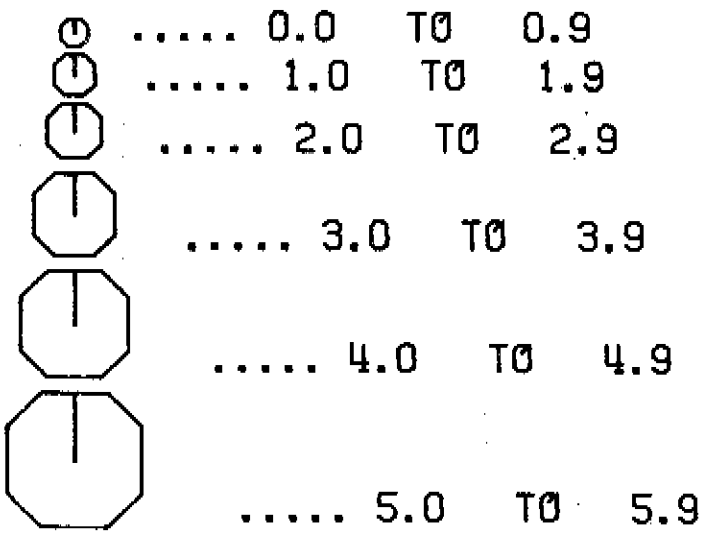

Figure 2. Seismicity in the regional vicinity of the Dixieland fault. "A" quality epicentral plots from Real and others (1977).

(DATA SOURCES ARE: FOR 1900-1931, CDMG SPECIAL REPORT 135; FOR 1932-1974, CALTECH AND U.C.BERKELEY FOR SOUTHERN AND NORTHERN CALIFORNIA RESPECTIVELY; AND SINCE 1969, THE USGS FOR CENTRAL CALIFORNIA. A COMPREHENSIVE CATALOG OF CALIFORNIA EARTHQUAKES IS AVAILABLE ON MAGNETIC TAPE AND MICROFICHE FROM CDMG.)

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